REMARKS

Applicants have made a number of editorial changes to claims 256, 257, 269, 278, 282-288, 296, 299, 304, 306, 315, 318, 323, 324, 325, 330, 332-335, 342-344 and 347. Claims 231 and 235 have also been amended. New claims 400 to 404 have been added. Support for new claims 400 to 404 can be found, for example, at page 149, lines 1-12 of applicants' specification. No new matter has been introduced by the present amendments. Upon entry of this amendment claims 1, 2, 5-64, 96-100, 218-233, 235-325 and 327-404 will be pending in the application.

Allowable Subject Matter

Applicants acknowledge the allowance of claims 1, 2, 5-43, 52-64, 96-100, 218-230, 242-325 and 327-399.

The indication of allowable subject matter in dependent claims 47-51 and 235-241 is also acknowledged.

Rejections Under 35 U.S.C. §103(a)

Reconsideration is respectfully requested of the rejection of claims 44-46 and 231-233 under 35 U.S.C. §103(a). The invention defined in the claims 44-46 and 231-233 is submitted as patentable over the disclosure in U.S. Patent No. 3,950,402 (Franz) and GB 2 224 505 (Pelyva et al.), respectively.

Applicants appreciate the consideration given by the Examiner to their previously submitted arguments for patentability of the rejected claims.

Independent claim 44 is directed to process for making an N-(phosphonomethyl)glycine product in which a reaction product solution containing N-(phosphonomethyl)glycine product is produced by catalytically oxidizing an N-(phosphonomethyl)iminodiacetic acid substrate in an oxidation reactor system. N-(phosphonomethyl)glycine product is recovered by two sequential crystallizations from the reaction product solution. More particularly, N-(phosphonomethyl)glycine product is precipitated from the reaction product solution to produce a primary product slurry comprising precipitated N-

(phosphonomethyl)glycine product crystals and a primary mother liquor. Precipitated N-(phosphonomethyl)glycine product crystals are separated from the primary mother liquor. The primary mother liquor is subjected to evaporative heat-driven crystallization to thereby evaporate water from the primary mother liquor, precipitate additional N-(phosphonomethyl)glycine product crystals and produce a secondary mother liquor. Through heat-driven evaporative crystallization, heat is provided to the mother liquor to vaporize water and small molecule impurities that can be advantageously purged from the process, for example, as part of an evaporative crystallizer overhead vapor stream.

In order to establish a *prima facie* case of obviousness, the Patent Office must establish, among other things, that the reference, or references when combined, teach or suggest all of the claim limitations and that there is some teaching, suggestion or incentive to modify the reference or to combine reference teachings. Applicants respectfully submit that the Office action fails to present a *prima facie* case of obviousness.

The details of the teaching in Franz are set forth fully in applicants' Amendment C filed November 19, 2003. Applicants acknowledge that Franz, in Example 1, discloses a sequential crystallization of N-(phosphonomethyl)glycine product by first cooling the reaction mixture to room temperature and then to 0°C in a refrigerator to produce an N-(phosphonomethyl)glycine-containing precipitate recovered by filtration followed by further refrigeration and cooling of the resulting filtrate to produce additional precipitate.

As acknowledged in the Office action, Franz fails to teach evaporating water from primary mother liquor to precipitate additional N-(phosphonomethyl)glycine product and produce a secondary mother liquor as called for in the process of claim 44. In order to overcome this deficiency, the Examiner refers to disclosure in Franz in Example 7, at col. 5, lines 59-61 of evaporating the <u>reaction mixture</u> to crystallize N-(phosphonomethyl)glycine product and asserts that it would have been obvious to replace the further cooling of the <u>filtrate</u> in

Example 1 and instead evaporate the filtrate because evaporation would allow more complete recovery of the N-(phosphonomethyl)glycine product and would be less expensive.

The modification of the recovery scheme used in Example 1 postulated in the Office action would require first cooling the reaction mixture to recover a first precipitate and mother liquor followed by evaporating the filtrate to recover additional product. Nothing in the disclosure of Franz suggests such a combination of cooling and evaporation crystallization steps. According to Franz, the N-(phosphonomethyl)glycine is "isolated by precipitation, for example, by the addition of a water-miscible organic solvent, evaporation of water, or cooling" (col. 1, lines 28-31). All of the Examples provided by Franz, which recover the N-(phosphonomethyl)glycine product by either cooling or subjecting the reaction mixture to evaporative crystallization (e.g., at reduced pressure) or in accord with this teaching. The clear teaching of Franz is to select a recovery scheme that involves cooling or evaporation of the reaction mixture, not a combination of both. Accordingly, the observation in Example 1 that further cooling of the mother liquor filtrate in the refrigerator resulted in precipitation of additional product notwithstanding, one skilled in the art selecting evaporation as the recovery mechanism would crystallize the product from the reaction mixture in a single step as done in each of the Examples of Franz that employed evaporation as the recovery technique. Nothing in the teaching of Franz suggests the advantages provided by the process defined in claim 44 which allows impurities present in the primary mother liquor to be evaporated and effectively removed from the process in a second, serial heat-driven evaporative crystallization step. It is only through impermissible hindsight that applicants' discovery of the recovery scheme defined in claim 44 might appear to be plausibly motivated by the teachings of Franz.

Accordingly, applicants respectfully submit that claim 44 and dependent claims 45 and 46 are patentable over Franz.

Independent claim 231 is directed to a process for the

preparation of an N-(phosphonomethyl)glycine product and requires that the product mixture produced by catalytic oxidation of the N-(phosphonomethyl)iminodiacetic acid substrate be divided into a primary fraction and a secondary fraction comprising N-(phosphonomethyl)glycine product. N-(phosphonomethyl)glycine product is crystallized from the primary fraction and the resulting primary mother liquor is recycled and used as a source of water in the preparation of the aqueous feed mixture comprising the N-(phosphonomethyl)iminodiacetic acid substrate introduced into the catalytic reactor system. As amended, claim 231 further requires purging at least a portion of the secondary product mixture fraction for removal of by-products and impurities from the process. For example, as taught by applicants, N-(phosphonomethyl)glycine may be crystallized from the secondary fraction by evaporative crystallization to produce additional solid N-(phosphonomethyl)glycine product and a secondary mother liquor, and the secondary mother liquor purged from the process. Both dividing the product mixture and purging material from a fraction of the divided product mixture is advantageous in the practice of the process defined in claim 231 because it reduces the rate of contaminant (e.g., larger molecule impurities) buildup in the system, thus making recycle of the solids-depleted streams (i.e., primary mother liquor) recovered from another fraction of the divided product mixture (i.e., the primary fraction) more feasible (See, for example, the disclosure at page 143, lines 3-22 of the specification).

Pelyva et al. disclose a process for the preparation of N-(phosphonomethyl)glycine by the sulfuric acid catalyzed oxidation of N-(phosphonomethyl)iminodiacetic acid using hydrogen peroxide as the oxidizing agent. In the process described by Pelyva et al., the sulfuric acid catalyzed oxidation of N-(phosphonomethyl)iminodiacetic acid with hydrogen peroxide is carried out while evaporate is contemporaneously distilled from the oxidation reaction medium to concentrate the oxidation reaction medium. The evaporate is distilled off through a cooler into a receiver. The entire resulting reaction medium is cooled

to crystallize N-(phosphonomethyl)glycine which is then filtered from the sulfuric acid waste liquor. The sulfuric acid waste liquor is recycled and used as an oxidation medium in which additional N-(phosphonomethyl)iminodiacetic acid is oxidized while evaporate is contemporaneously distilled from the oxidation medium. The process is repeated over several cycles. In each cycle the entire resulting reaction medium is cooled to crystallize N-(phosphonomethyl)glycine and the resulting sulfuric acid waste acid liquor recycled and used as the oxidation medium "heel" in the subsequent reaction cycle.

As acknowledged in the Office action, the cited reference fails to teach or suggest dividing the oxidation medium into primary and secondary fractions. Pelyva et al. further fail to teach or suggest purging at least a portion of the divided oxidation medium to remove by-products and impurities from the process as now called for in claim 231. To the contrary, according to Pelyva et al., one of the surprising advantages of their sulfuric acid catalyzed oxidation process is that impurities, which decrease the quality of the N-(phosphonomethyl)glycine product and which would be expected to become enriched in the waste acid liquor, especially after several cycles, are not enriched or at least not to an extent that impairs the quality of the product obtained (See Pelyva et al. at page 5, line 20 to page 6, line 8). Accordingly, regardless of whether one skilled in the art would be motivated to divide the oxidation medium of Pelyva et al. into plural fractions for any of the reasons suggested in the Office action (a conclusion that applicants respectfully do not concede), there is no suggestion or motivation of purging material in a fraction of the divided oxidation medium to remove by-products and impurities from the process in view of the teaching in Pelyva et al. that impurity build up in their process is not a problem.

In view of the above, claim 231 as amended and claims 232-233 and 235-241 depending therefrom are submitted as patentable over the disclosure by Pelyva et al.

Conclusion

In view of the above, favorable reconsideration and allowance of all pending claims are respectfully solicited.

Applicants request an extension of time to and including August 26, 2004 for filing a response to the above-mentioned Office action. A check in payment of the applicable extension * fee is enclosed.

The Commissioner is requested to charge any fee deficiency or overpayment in connection with this amendment to Deposit Account 19-1345.

Respectfully submitted,

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